

Amendments to the Claims

A full listing of the claims is as follows:

1. (Currently amended) An apparatus for determining the orientation of a medical device within a patient's body, comprising:

a catheter having a tube wall defining a lumen therethrough, wherein the catheter is radiopaque under x-ray fluoroscopy; and

a plurality of tube wall bending indicators located at least on or within the catheter wall at a reference portion of the catheter to become curved where the catheter passes through an anatomical reference when the distal end of the catheter is at a target site within the patient's body;

wherein the plurality of tube wall bending indicators provide an indication of tube wall bending to indicate the orientation of the reference portion of the catheter relative to the anatomical reference.

2. (Currently amended) The apparatus of claim 1, wherein the catheter further comprises:

a distal outlet in communication with the lumen, and wherein the tube wall bending indicators provide an indication of the orientation of the catheter distal outlet relative to the anatomical reference is to be determined based on a predetermined orientation of the catheter distal outlet relative to the reference portion of the catheter and the orientation of the reference portion of the catheter relative to the anatomical reference.

3. (Previously presented) The apparatus of claim 1 wherein the tube wall bending indicators comprise:

a plurality of strain gauges for providing said indication of tube wall bending by changing an electrical resistance in accordance with an amount of tube wall bending within the vicinity of each strain gauge.

4. (Previously presented) The apparatus of claim 3, further comprising an orientation display to display an indication of the orientation of the reference portion of the catheter relative to the anatomical reference based on the electrical resistance change of the strain gauges.

5. (Original) The apparatus of claim 1, wherein the tube wall bending indicators comprise:
a plurality of rods movably embedded in the catheter wall, wherein each of the rods extends from a proximal end of the catheter to at least the reference portion of the catheter that becomes curved when the catheter is placed at the target site, the rods to provide said indication of tube wall bending by changing an amount of protrusion relative to the proximal end of the catheter in accordance with an amount of tube wall bending in the vicinity of each rod.

6-21. (Canceled)

22. (Previously presented) The apparatus of claim 4, further comprising signal wires linking each of the plurality of strain gauges to the orientation display, and wherein the electrical resistance changes in the strain gauges are transmitted to the orientation display via the signal wires.

23. (Previously presented) The apparatus of claim 3, wherein the strain gauges are located within the catheter wall.

24. (Previously presented) The apparatus of claim 1, wherein bending of the tube wall imparts tensile or compressive stress on one or more of the bending indicators.

25. (Previously presented) The apparatus of claim 1, wherein the bending indicators comprise:
a plurality of rods longitudinally disposed within the tube wall, wherein each of the rods are free to move longitudinally relative to the tube wall, and wherein each of the rods extends from a proximal end of the catheter to at least the reference portion of the catheter.

26. (Previously presented) The apparatus of claim 25, wherein the distal ends of the rods are fixed to the tube wall.

27. (Previously presented) The apparatus of claim 25, wherein each of the rods protrudes

from the proximal end of the catheter, and wherein the amount of protrusion of each rod varies according to the amount of tube wall bending in the vicinity of each rod.

28. (Previously presented) The apparatus of claim 25, further comprising a panel at a proximal portion of the catheter, wherein the proximal ends of the rods emerge from the face of the panel.

29. (Previously presented) The apparatus of claim 28, wherein the panel is located on the proximal end of the catheter.

30. (Previously presented) The apparatus of claim 28, further comprising a side tube connected to a proximal portion of the catheter, wherein the rods are routed through the side tube, and wherein the panel is located on the side tube.

31. (Previously presented) The apparatus of claim 28, wherein all the rods extend from the face of the panel approximately the same distance when the catheter is in an unbended configuration.

32. (Canceled)

33. (New) The apparatus of claim 1, further comprising an imaging device to image the distal end of the catheter and provide an indication of the position of the distal end of the catheter relative to the target site.

34. (New) The apparatus of claim 33, wherein the imaging device comprises a fluoroscopic device.